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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/721,562

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Benjamin A. Leis

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EXAMINER

DINH, NGOC V

ART UNIT

PAPER NUMBER

2189

MAIL DATE

DELIVERY MODE

05/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/721,562

Applicant(s)

LEIS ET AL.

Examiner

NGOC V. DINH

Art Unit

2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 6-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-10, 12, 14, 18-20, 22-23 is/are rejected.
- 7) ☒ Claim(s) 11, 13, 15-17 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

FINAL REJECTION

1. This Office Action is responsive to Amendment filed 04/20/2007 in which claims 4-5 are canceled.
2. Regarding Applicant's remarks that Challenger does not disclose "the session key to become unavailable or lost after a boot". It is the Examiner's position that Challenger discloses this limitation as [encryption key is unavailable at all other times during and after said boot, page 6/claim 4].

Regarding Applicant's remarks that "the key is used to encrypt/decrypt in a **paging file**". It is the Examiner's position that Carter discloses this limitation as ["before these **virtual memory pages** are loaded, the data must be decrypted by the kernel's encryption drivers, page 15/[0210]; page 16/[0212], lines 14-27].

Regarding Applicant's remarks that Masui teaches or suggests nothing when the key is stored in a volatile memory. However, one having ordinary skill in the art would recognize that storing encryption key in a volatile memory is another way of at least to protect encryption key from further exposure once the system is power off.

Applicant's arguments have been fully considered but are not persuasive. The rejection is maintained the same as the previous office action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. Claims 1-3, 7-10, 12, 14, 18-20, 22-23 are rejected under 35 U.S.C 103(a) as being unpatentable over Carter US 2004/0091114, and in view of Challener et al. us 2003/0188179.

Carter teaches:

Per claims 1, 9, 14, 20, 23, a system for providing a computing environment, the environment including a virtual memory [page 3/[0032]], the system comprising: a virtual memory manager [a paging system 1320, which is part of a virtual memory system, page 15/[0203-0204]] that provides the virtual memory by moving or copying data between a volatile memory and a paging file [see section 2 above] stored in a hard disk, the system protecting the contents of the virtual memory by encrypting the data stored in the paging file [The EOS (Encrypting operating system) is configured to use a symmetric encryption algorithm and an encryption key to encrypt data transferred from physical memory to secondary devices, such as disks, swap device, network file systems, network buffers, pseudo file systems, or any other structures external to the physical memory and on which can data can be stored; abstract; page 4/[0054]; fig. 15, page 15/[0208]; page 15[0203-0204]; Encrypted File System, page 7/[0105]], and a key generation that generates a session key, the session key being used to encrypt the data , and the session key being further needed for subsequent decryption of the encrypted key [encryption/decryption key, page 16/[0212], lines 16-22].

Carter does not teach the session key is non-persistently stored in a manner that causes the session key not to persist across boots that occurs after generation of the session key.

Challener teaches the session key is non-persistently stored in a manner that causes the session key to become unavailable in the event that a boot occurs after generation of the session key [page 6/claim 4].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Challener to Carter so that the encryption key is not directly accessible to the application, thus guaranteeing the OS or other programs running on the system are not provided with access to and cannot "grab" the crypto keys and also cannot save data in memory locations to which they do not have authorization [page 5/[0054]].

Per claim 2, the virtual memory manager communicates the data to a file system, wherein the

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file system causes the data to be encrypted prior to storing the data in the paging file [encrypting and decrypting data transferred between a computer's physical memory and a secondary device, page 2/[0014]; page 2/[0019]; page 11/[0163-0164]].

Per claim 3, the file system marks the paging file for encryption, and wherein the paging file, upon receiving a request to store the data in the paging file, determines that the paging file has been marked for encryption and communicates with an encryption component [EOS, page 4/[0558, 0069] to encrypt the data [the EOS provides the following additional functions: (1) it creates secured files by encrypting data; (2) it prevents the mass removal of files; (3) it provides authenticated authorized access to secured files, for opening, reading, and writing; (3) it provides authenticated authorization for seeking within a file; (5) it ensures that when files are closed, and thus written back to disk, the files are encrypted; (6) it encrypts secured directories, thus securing them; (7) it prevents the unauthorized listing of directories; and (8) it controls access to the encrypted file names (i.e., the contents of the directories), thus preventing the unauthenticated and unauthorized removal of the encrypted files, page 6/[0097]].

Per claim 7, encryption of the data is performed according to one or more of the following algorithms: Data Encryption Standard (DES); Triple-DES (3DES); or Advanced Encryption Standard (AES) [page 1/[0006-0007].

Per claim 8, the system further protects the contents of the virtual memory by ensuring that all user mode applications and data that are stored in the virtual memory are encrypted when being stored in the paging file [abstract; page 2/[0019]].

Per claim 10, generating said key upon a boot of said machine [bootstrap code, page 17/[0218]].

Per claim 12, the file system causes said contents to be encryption by communicating with an encryption component, the encryption component encrypting files that have been marked by the file system for encryption [page 4/[0058, 0068]].

Per claim 18, said key is generated before said virtual memory manager directs the storage of data into the paging file [data transmitted to the sockfs file system, and thus over a socket connection, is encrypted before it is transmitted from the physical memory of a computer system over the socket connection, page 14/[0202]].

4. Claims 6, 19, 22 are rejected under 35 U.S.C 103(a) as being unpatentable over Carter, in view of Challener et al., and further in view of Masui et al US 2004/0190714.

Per claims 6, 19, 22: Carter and Challener do not teach protects the contents of the virtual memory by ensuring that there is no persistent storage of the session key.

Masui teaches the encryption key is stored in a volatile memory [page 1[0014]].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Masui to Carter-Challener so that the encryption key will be lost and not being stored permanently when the system is turned off.

Allowable Subject Matter

5. Claims 11, 13, 15-17, 21 are objected to as being dependent upon a rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. ATTENTION

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the

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THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

Any response to this action should be mailed to:

Under Secretary of Commerce for intellectual Property and Director of the
United States Patent and Trademark Office
PO Box 1450


Alexandria, VA 22313-1450

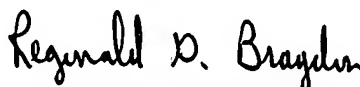
or faxed to:

(571) 273-8300, (for Official communications intended for entry)

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PMR) system. Status information for published Applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pak-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc Dinh whose telephone number is (571) 272-4191. The examiner can normally be reached on Monday-Friday 8:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon, can be reached on (571) 272-4204.


NGOC DINH
May 07, 2007


REGINALD BRAGDON
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100